

# What's inside the 5.5 GHz high-pass filter HPF5500M

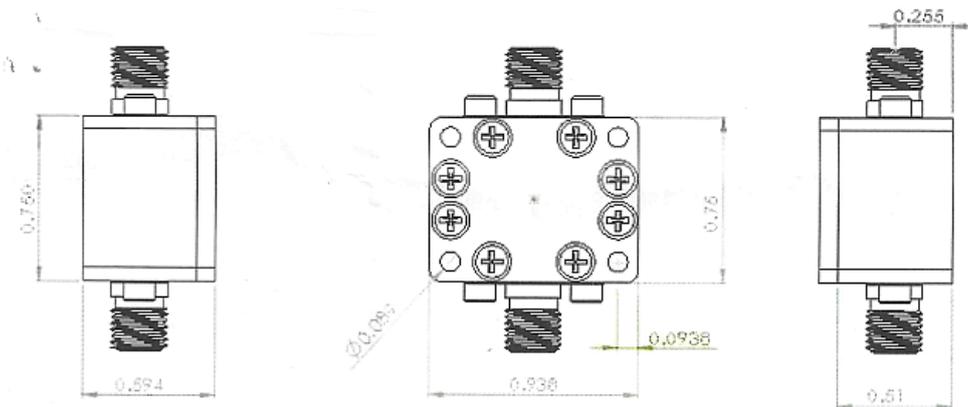
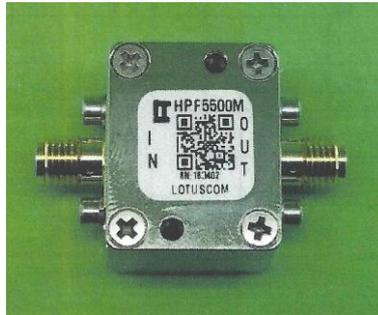
Matthias, DD1US, January 4<sup>th</sup> 2019

Hello,

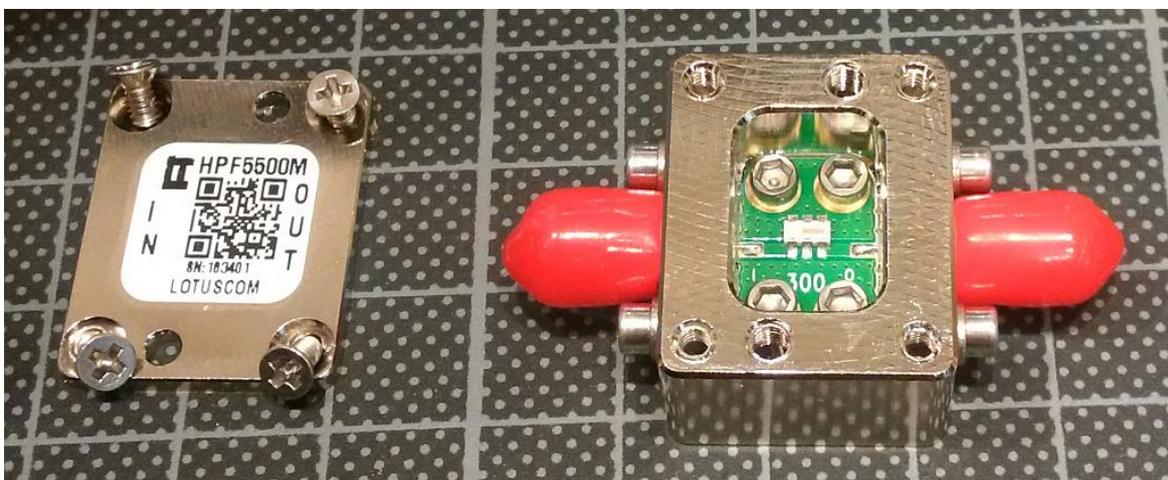
In order to improve the output spectrum of a frequency-doubler which I am presently building I bought a 5.5 GHz high-pass filter from Lotus Communication Systems Inc. based in Weston, MA, USA. The high-pass filter HPF5500M comes in a little milled metal encasing with female SMA connectors at the input and output ports.

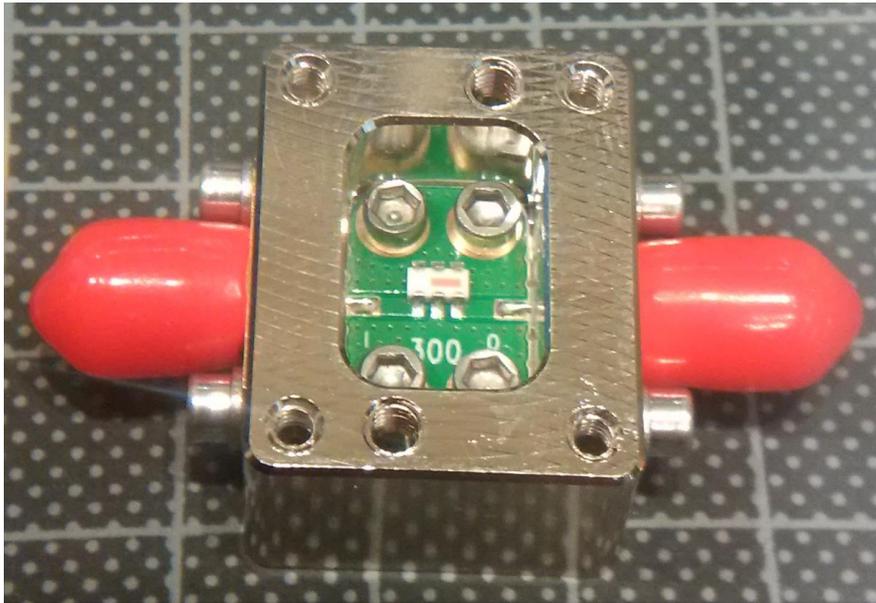
The filter is specified to have a 3dB cutoff frequency of 5.5 GHz and an insertion loss of less than 1.5dB from 6.6 to 10 GHz. The attenuation below the cutoff frequency is specified to be more than 20dB at 4.5 GHz and more than 30dB below 4 GHz. Maximum power handling capability is specified to be 7 Watts.

Here are some pictures of the filter, also with the lid removed:



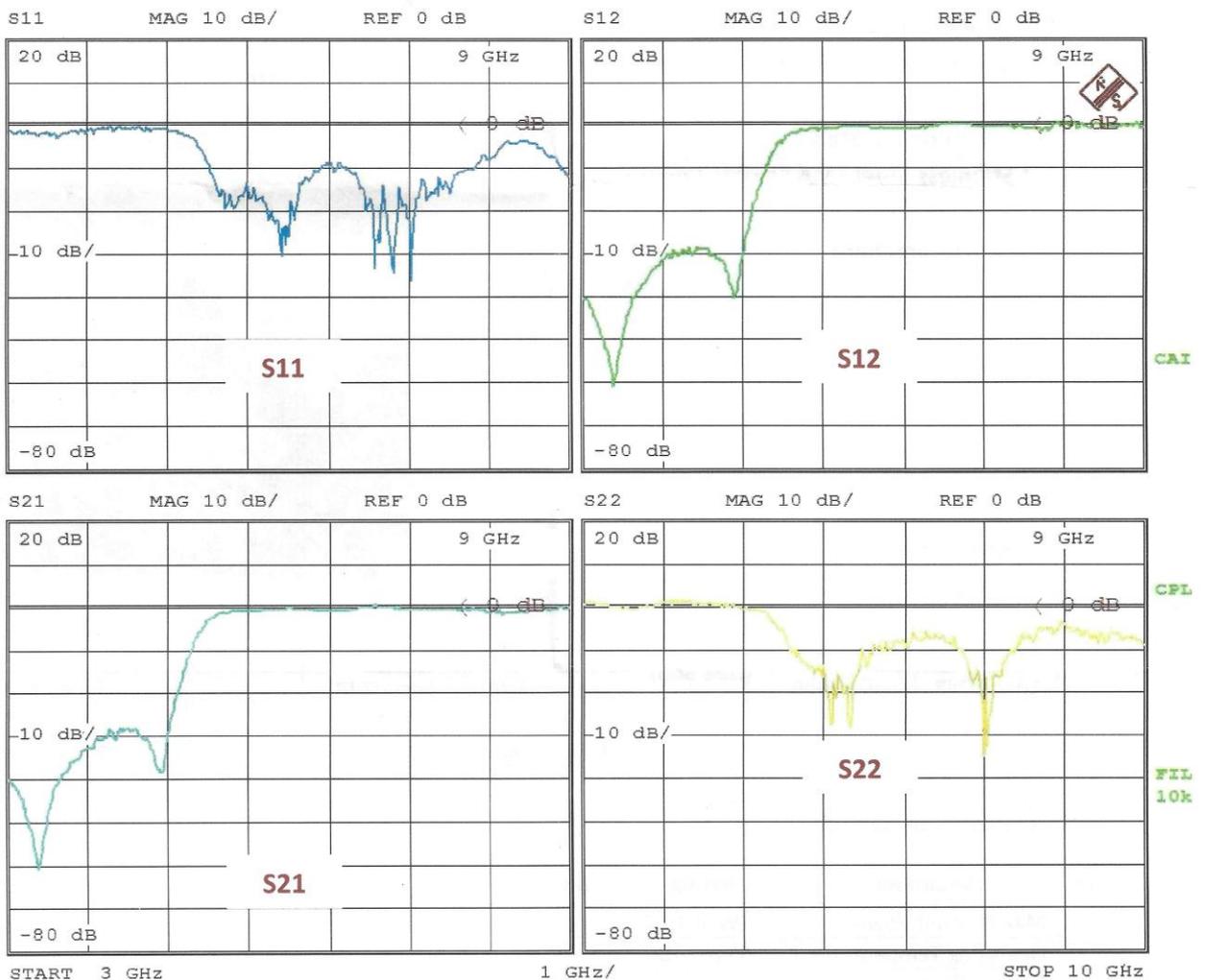
Dimensions are given in inch.





As can be seen the only component on the PCB is an integrated device with 6 pins. The datasheet mentions that it is a 5-section filter based on LTCC. Checking respective datasheets from possibly suppliers I found the HFCN-5500 high-pass filter from Mini-Circuits matching the data of the HPF5500M exactly.

Next, I verified the transfer characteristic of the filter and compared it with the datasheet. Here are the S-parameters as published by Lotus Communication Systems Inc:



Here is the transfer characteristic which I measured it with a spectrum analyzer and tracking generator. The measurement was performed from DC to 7 GHz with a horizontal scaling of 700 MHz/div and a vertical scaling of 10dB/div:



As you can see the 3dB cutoff frequency is at approximately 5.55 GHz and also the complete curve fits quite well with the reference plot in the datasheet. Also, the insertion loss is in spec.

I always appreciate feedback. Please send it to Email address given below. Many thanks in advance.

Best regards

Matthias DD1US

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